

REMARKS

By the subject Amendment, Applicants have amended Claims 1 and 10 and added Claims 27 and 28. Accordingly, Claims 1 to 7, 10 to 18 and 21 to 28 are presently pending herein. Claims 1, 10, 21, 25 and 27 are presented in independent form.

The Official Action dated March 6, 2006 objected to Claims 1 and 10. Specifically, it was requested that the word "therethrough" be changed to two words. Applicants have amended Claims 1 and 10 in the fashion requested by the Examiner. It will be readily appreciated that the subject amendment of Claims 1 and 10 does not in any way alter the scope of these claims.

The Official Action dated March 6, 2006, rejected Claims 1 to 7, 10 to 18, and 21 to 26 as allegedly being anticipated under 35 U.S.C. 102(b) by Tucker et al. (i.e., U.S. Patent Application Publication No. 2002/0117214). The legal standards for anticipation rejections of the type imposed by the Official Action issued in this patent application are set forth below.

"Anticipation...requires that the *identical invention that is claimed* was previously known to others and thus is not new...*When more than one reference is required to establish unpatentability of the claimed invention anticipation under § 102 can not be found*, and validity is determined in terms of § 103." *Continental Can v. Monsanto*, 948 F.2d 1264, 1267 (Fed. Cir. 1991)(emphasis added).

"A patent is invalid for anticipation *when the same device or method, having all the elements and limitations contained in the claims, is described in a single prior art reference.*" *ATD Corporation v. Lydall, Inc.*, 159 F.3d 534, 545 (Fed. Cir. 1998)(emphasis added). See also *Crown Operations International, Ltd. v. Krone*, 289 F.3d 1367, 1375 (Fed. Cir. 2002)

The single reference must have an enabling disclosure. See *Advanced Display Systems Inc. v. Kent State University*, 54 USPQ 2d 1673, 1679 (Fed. Cir. 2000) (“Accordingly, invalidity by anticipation requires that the four corners of *a single, prior art document* describe every element of the claimed invention, expressly or inherently, such that *a person of ordinary skill in the art could practice the invention without undue experimentation.*”)(emphasis added); See also, *PPG Industries, Inc. v. Guardian Industries Corp.*, 37 USPQ 2d 1618, 1624 (Fed. Cir. 1996) (“To anticipate a claim, a reference must disclose every element of the challenged claim and *enable one skilled in the art to make the anticipating subject matter.*”)(emphasis added)

“To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. *Such evidence must make clear that the missing descriptive matter is necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Continental Can*, 948 F.2d at 1268. (emphasis added)

“*Inherency, however, may not be established by probabilities or possibilities.* The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)(emphasis added). See also, *Continental Can*, 948 F.2d at 1269.

“[T]he initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention rests upon the examiner... In relying upon inherency, *the examiner must* provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ 2d 1461, 1464 (BPAI 1990)(emphasis in original)

When evaluated under these standards, the rejection of claims 1 to 7, 10 to 18 and 21 to 26 under 35 USC § 102 cannot be sustained. A fundamental difference exists between Tucker et al. and Applicants' invention, i.e., Tucker et al. is specifically directed at maintaining a stable *line pressure*. Applicants' invention, on the other hand, is directed at controlling the rate of fluid flow to ensure that it stays within predetermined values or limits. For this reason alone Applicants' invention is not anticipated by Tucker et al.

More specifically, Applicants' invention, as recited in Claim 1, is directed to an apparatus *to control the rate of flow of a stream of pressurized fluid through a conduit*. The apparatus comprises *a flow measurement device for generating an output signal proportionate to the rate of flow of the fluid there through*. The flow measurement device is operatively connected to the conduit. A flow control device is operatively connected to the conduit downstream of the flow measurement device. The flow control device includes an adjustable orifice wherein upon the opening of the orifice a portion of the stream of pressurized fluid is independently released from the conduit by the flow control device. *A controller is operatively connected to the flow control device for receiving the output signal generated by the flow measurement device and for causing the adjustable orifice in the flow control device to open or close as necessary to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.*

Tucker et al. is specifically concerned with a control system for a precision irrigation system for use in low volume, high frequency irrigation (example drip irrigation) (See Tucker et al., column 1, lines 16-31). While at first blush Tucker et al. may appear to share some common elements with Applicants' invention, the device and system disclosed and taught by Tucker et al. is fundamentally

different from the Applicants' invention. Tucker et al. describe a *pressure* control system using throttling valves that are actuated by fluid within the flow line to inflate or deflate a bladder, with the bladder thereby enlarging or reducing the size of the flow area. The bladder is inflated by increasing the volume of fluid present within control volume 32 by opening solenoid 27 and allowing for the flow of fluid through lines 22 and 24. (See Tucker et al., column 7, line 66 through column 8, line 11 and Figure 1) Deflating the bladder is achieved through venting or discharging fluid to the atmosphere by opening solenoid 29 and allowing fluid to escape through discharge lines 26 and 28 (See Tucker et al., column 7, line 66 to column 8, line 7).

One of the fundamental differences between Tucker et al. and Applicants' invention is that Tucker et al. is very specifically directed at maintaining a stable line pressure and not controlling the rate of fluid flow through a conduit. Tucker et al. specifically teaches that for the particular form of drip irrigation to which it is directed "great care and precision should be exercised in the design phase of an irrigation project in order to ensure that pressure variations do not exceed certain defined criteria" (See Tucker et al. column 1, lines 58-62). As Tucker et al. expressly states, it is concerned with maintaining pressure not controlling the rate of flow of fluid to within predetermined limits or values. Hence, pressure control is at the heart of the disclosure and teachings of Tucker et al. (Tucker et al., column 4, lines 38-45, column 5, lines 6-9).

In contrast, Applicants' is directed at controlling the rate of flow of a stream of fluid through a conduit. The operational sensors in Tucker et al. (items 19 and 21 in Figure 1, items 23 and 25 in Figures 2, 3, 4 and 6) are pressure sensors and not flow measurement devices as claimed by Applicants. The so called "flow measurement device" as referenced by the Examiner in paragraph 4 of the Official Action (paragraph 92 of Tucker et al.) is not an operational sensor

that in any way effects or controls the flow of fluid through the conduit, but is merely a sensor that was placed within the system for experimental purposes in order to plot flow on the pressure graph shown in Figure 7. With respect to the “flow sensor” as discussed by Tucker et al. at paragraph 92 (See Tucker et al., column 15, lines 46 through 65), this element is simply not a flow measurement device that is capable of generating an output signal proportionate to the rate of flow of fluid through a conduit such that a controller can receive the output signal and cause a flow control device to operate in order *to maintain the rate of fluid flow through the conduit within a pre-determined range*. Applicants’ claimed invention is further distinguished from Tucker et al. as it is capable of ensuring stable fluid flow rates with varying line pressures whereas the system described in Tucker et al. cannot. Simply put, Tucker et al. is a pressure control system and not a fluid flow control system.

Applicants respectfully submit that Claim 1 patentably defines over Tucker et al. Claims 2 to 7 depend from Claim 1 and, therefore, are allowable for at least the reasons that Claim 1 is allowable.

Applicants’ invention, as recited in Claim 10, is directed to an apparatus *to control the rate of flow of pressurized fluid through a conduit connected to a pump*. The apparatus permits the discharge of fluid from the conduit at a rate below the output rate of the pump. The apparatus comprises a flow measurement device for generating an output signal proportionate to the rate of flow of the fluid there through. The flow measurement device is operatively connected to the conduit. The apparatus further includes an adjustable flow control device for permitting a portion of the pressurized fluid to be independently released from the conduit *to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined*

limits. The flow control device is operatively connected to the conduit downstream of the flow measurement device.

As explained in connection with Claim 1, Tucker et al. does not disclose each and every element of the claimed invention. For example, Tucker et al. does not teach or suggest an adjustable flow control device to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits. Tucker et al. is only concerned with controlling pressure not flow rates. As such, Tucker et al. cannot possibly anticipate Claim 10.

Claims 11 to 18 depend from Claim 10 and, therefore, are allowable for at least the reasons that Claim 10 is allowable.

Applicants' invention, as recited in Claim 21, is directed to *a method of controlling the rate of flow of a stream of pressurized fluid through a conduit.* The method comprises the steps of: (i) determining the rate of flow of fluid through a portion of the conduit and generating a signal proportionate to the fluid flow rate; (ii) directing the signal to a controller operatively connected to a flow control device, the flow control device operatively connected to the conduit downstream of the portion of the conduit and including an adjustable orifice wherein upon the opening of the orifice a portion of the stream of pressurized fluid is independently released from the conduit by the flow control device; and, (iii) *with the controller, comparing the signal to a pre-determined value and activating the flow control device to open or close the adjustable orifice as necessary to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.*

Applicants' invention as recited in Claim 21 is clearly not anticipated by Tucker et al. as Tucker et al. does not disclose for example the step of *comparing the signal to a pre-determined*

value and activating the flow control device to open or close the adjustable orifice as necessary to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits. Once again, Tucker et al. is not concerned with maintaining the fluid flow rate to with predetermined limits.

Claims 22 to 24 depend from Claim 21 and, therefore, are allowable for at least the reasons that Claim 21 is allowable.

Applicants' invention, as recited in Claim 25 is directed to *a method to control the rate of flow of pressurized fluid through a conduit connected to a pump.* The method permits the discharge of the fluid from the conduit at a rate below the output rate of the pump. The method comprises the steps of: (i) with a flow measurement device determining the rate of flow of fluid through a portion of the conduit and generating a signal proportionate to the fluid flow rate; and, (ii) *comparing the generated signal to a pre-determined value and activating an adjustable flow control device operatively connected to the conduit, downstream of the portion of the conduit, to permit a portion of the pressurized fluid to be independently released from the conduit to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.*

Tucker et al. clearly does not anticipate Claim 25 for at least the reasons that it does not teach the step of *comparing the generated signal to a pre-determined value and activating an adjustable flow control device operatively connected to the conduit, downstream of the portion of the conduit, to permit a portion of the pressurized fluid to be independently released from the conduit to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.* Simply put, Tucker et al. is a pressure control system not a flow

control system.

Claim 26 depends from Claim 25 and, therefore, is allowable for at least the reasons that Claim 25 is allowable.

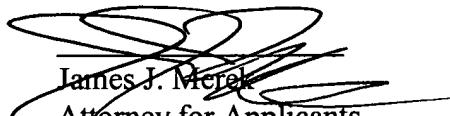
Claims 27 and 28 patentably define over Tucker et al. as it fails to teach or suggest Applicants' invention set forth in these claims.

Applicants respectfully submit that the subject patent application is in condition for allowance. Accordingly, it is respectfully requested the subject patent application be passed to issuance without delay.

It is believed that no fees are due. However, should that determination be incorrect, the Commissioner is hereby authorized to charge any deficiencies to Deposit Account No. 50-0562 and notify the undersigned in due course.

Respectfully submitted,

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